TOP FUEL | 2016

"LWR fuels with enhanced safety and performance"

September 11-16, 2016
Boise, Idaho, USA

Sponsored by: **AMERICAN NUCLEAR SOCIETY** and **IDAHO SECTION – AMERICAN NUCLEAR SOCIETY**

Welcome

About the Meeting

Welcome to Boise, Idaho, U.S.A. and the Top Fuel 2016 Conference!

Top Fuel, also called Light Water Reactor (LWR) Fuel Performance Meeting, is an annual topical meeting organized by the American Nuclear Society, the European Nuclear Society, the Atomic Energy Society of Japan, the Chinese Nuclear Society, the Korean Nuclear Society, and the International Atomic Energy Agency. Top Fuel's primary objective is to bring together leading specialists in LWR fuel from around the world to analyze advances in nuclear fuel technology and to use the findings of the latest cutting-edge research to help manufacture high performance nuclear fuels of today and tomorrow. The conference brings together a diverse group of scientists, engineers, and operational managers from around the world specializing in nuclear fuel and material issues.

The conference hosts two plenary sessions, two special sessions, and numerous technical sessions organized into five technical track areas:

Track 1: Fuel Performance Reliability, Operations, and Maintenance Experience
Track 2: Advances in Fuel Technologies (e.g., Enhanced Accident Tolerant Fuel)
Track 3: Transient and Off-normal Fuel Behavior
Track 4: Used Fuel Storage, Transportation, and Reuse/Recovery
Track 5: Fuel Modeling and Analysis

Top Fuel 2016 will provide an excellent communications network and forum for information exchange amongst international authors and participants from government organizations, national laboratories, academia, and industry.

The venue for Top Fuel 2016 is the Boise Centre, Idaho's premier convention center for meetings, conferences, and social events. Located in the heart of beautiful downtown Boise, Idaho, the Boise Centre is within walking distance of conference hotels and over 80 restaurants. We invite you to see all that Boise and the surrounding area has to offer!

Kemal Pasamehmetoglu, Idaho National Laboratory
Top Fuel 2016 General Chair

Welcome


Thank you for your patience!
While we are busily working to "construct" new and improved fuel systems, the Boise Centre is working to improve and expand the conference center to meet the needs of this growing city. While the first phase of the expansion is nearing completion, additional phases to connect the Boise Centre and the new Boise Centre East and to upgrade the Grove Plaza are still under way.
Please pardon the dust as you enjoy Top Fuel 2016 and everything that Boise has to offer!

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Monday Breakfast

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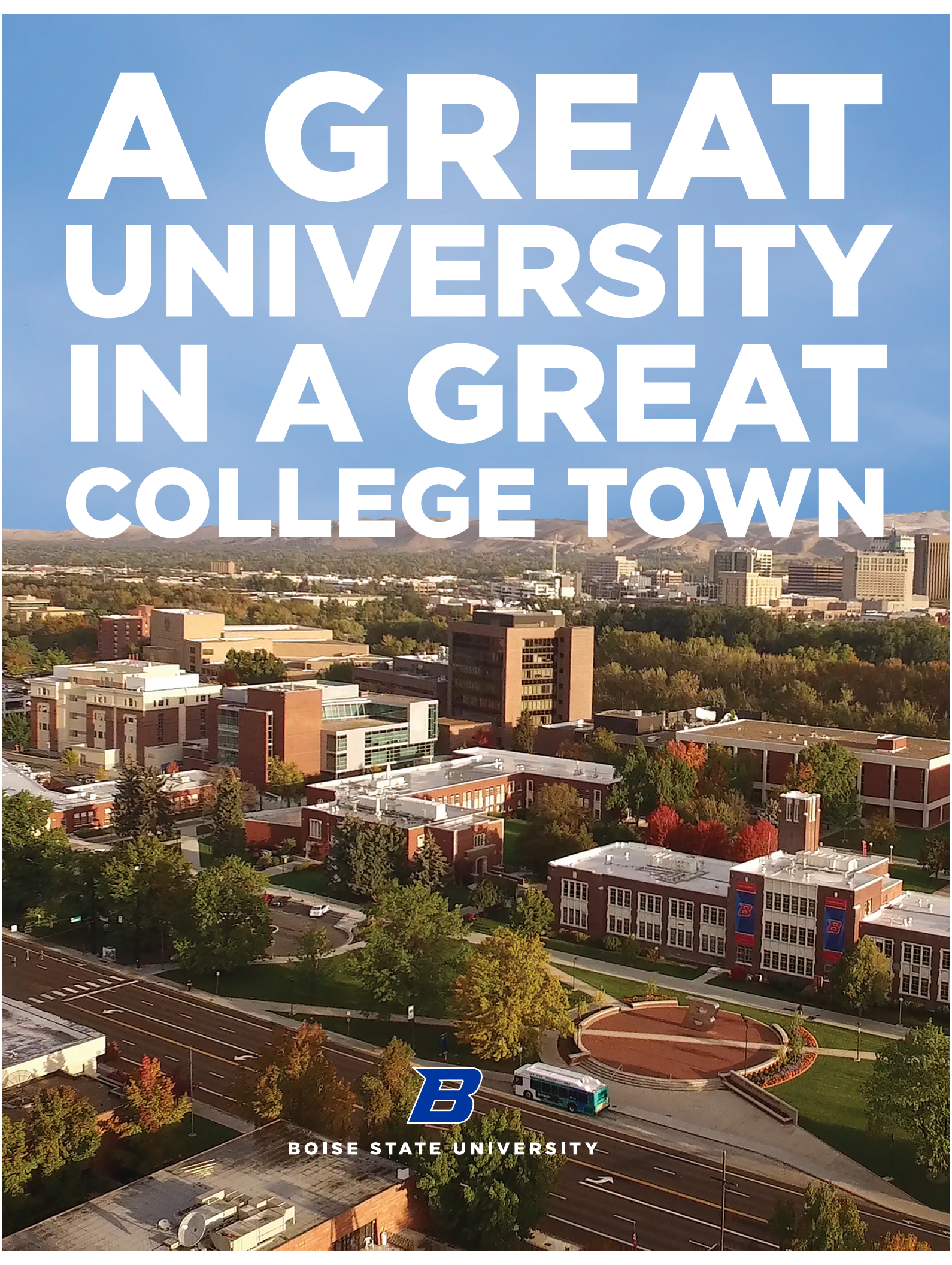

BOISE STATE UNIVERSITY

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Associate Laboratory Director for Nuclear Science and Technology

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Technical Program Committee

Technical Program co-Chairs

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John Strumpell, *AREVA Inc.*

Track 1: Fuel Performance Reliability, Operations, and Maintenance Experience

Track Chairs

Eric Mader, *Electric Power Research Institute*

Vincenzo Rondinella, *European Commission, Joint Research Centre*

Track 2: Advances in Fuel Technologies (e.g., Enhanced Accident Tolerant Fuel)

Track Chairs

Masaki Kurata, *Japan Atomic Energy Agency*

Rose Montgomery, *Oak Ridge National Laboratory*

Track 3: Transient and Off-normal Fuel Behavior

Track Chairs

Mark Petit, *Institut de Radioprotection et de Sûreté Nucléaire (IRSN)*

Dan Wachs, *Idaho National Laboratory*

Track 4: Used Fuel Storage, Transportation, and Reuse/Recovery

Track Chairs

Takanari Ogata, *Central Research Institute of Electric Power Industry (CRIEPI)*

Rich Ridder, *Dominion*

Track 5: Fuel Modeling and Analysis

Track Chairs

Chris Stanek, *Los Alamos National Laboratory*

Paul Van Uffelen, *European Commission, Joint Research Centre*

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Michelle Bales, *U.S. Nuclear Regulatory Commission*

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Clive Ingram, *U.K. Office of Nuclear Regulation*

Zeses Karoutas, *Westinghouse*

Yutai Katoh, *Oak Ridge National Laboratory*

Travis Knight, *University of South Carolina*

Yang-Hyan Koo, *Korea Atomic Research Institute*

Marion LaFlem, *CEA*

Ed Lahoda, *Westinghouse*

Tong Liu, *China General Nuclear Power Corporation (CGN)*

Dan Mathers, *National Nuclear Laboratories*

Margaret McGrath, *Halden Reactor Project*

Marie Moatti, *Électricité de France (EDF)*

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Suresh Yagnik, *Electric Power Research Institut*

Meeting Registration

The registration desk is open at times listed below. With the exception of Monday morning, the registration desk will be located on the 4th Floor of the Boise Centre East, in the foyer area between rooms 410 and 420. On Monday morning, a satellite registration desk will be located in the Summit Auditorium Foyer from 7:00 to 12:00, in advance of the Plenary Session that will be held in the Summit Auditorium in the Boise Centre.

Sunday, September 11

13:00 – 17:00	4th Floor Boise Centre East

Monday, September 12

7:00 – 12:00	Summit Foyer, Boise Centre
12:00 – 17:00	4th Floor Boise Centre East

Tuesday, September 13

7:00 – 17:00	4th Floor Boise Centre East

Wednesday, September 14

7:00 – 16:00	4th Floor Boise Centre East

On-site registration and ticket purchase may be paid via cash, check paid to Idaho ANS Idaho, or credit card.

Exhibit Hours

The opening reception, poster session, and coffee breaks will be held in close proximity to the exhibitor area (NW Foyer, 4th Floor Boise Centre East). Please plan to have your booth staffed during these times. Of course, you are welcome to staff the booths during sessions, but it is not required. The facility will be secured at night to allow you to leave your booth materials in place.

Sunday, September 11

13:00 – 17:00	Exhibit Set Up
18:00 – 19:30	Opening Reception

Monday, September 12

9:00 – 18:00	Exhibit Area Open
18:30 – 20:00	Poster Session

Tuesday, September 13

9:00 – 18:00	Exhibit Area Open

Wednesday, September 14

9:00 – 16:00	Exhibit Area Open
16:00 – 18:00	Exhibit Take Down

Breaks and Key Events

A continental breakfast will be provided each morning beginning at 7:00 in the Summit Auditorium Foyer, just prior to the plenary and special sessions that will be in the Summit Auditorium. The Monday morning break between Plenary I and Plenary II will also be held in the Summit Auditorium Foyer. All other breaks will be held in the Exhibit area in the NW Foyer on the 4th Floor of the Boise Centre East. The Sunday evening Welcome Reception and Monday evening Poster Session will both be held in the Boise Centre East, in the Exhibit area and room 420. The Tuesday evening Basque Banquet will be held outside on the Basque Block (details provided on page 15).

All lunches will be on your own. Maps and a list of nearby restaurants are provided at the Registration Desk.

Opening Reception

Each full registration includes one ticket to the opening reception, which will be held in the NW Lobby on the 4th Floor of the Boise Centre East, from 18:00 - 19:30. The reception will offer time for networking and viewing the exhibits over heavy appetizers and drinks. Additional tickets can be purchased at the registration desk for $85.

Poster Session

The Poster Session will be held Monday evening, 18:30-20:00, in Boise Centre East, Suite 420. Posters should be mounted on Monday between 16:30 and 18:00. The Poster Session will offer light appetizers and drinks while viewing both the posters and exhibits in the neighboring NW Lobby.

Speaker Preparation & Other Meeting Rooms

A speaker preparation room is offered in Suite 440 of the Boise Centre East. This room will be open Monday 12:00 – 18:30, Tuesday 9:30 – 18:00, and Wednesday 9:30 am – 18:00.

On Tuesday and Wednesday, rooms 430 A and B will be available for scheduling side meetings. To request and reserve one of these rooms, please see ReBekah Thompson at the Registration Desk. To make a reservation in advance of the meeting, please contact ReBekah at ReBekah.Thompson@inl.gov.

The Basque Museum and Cultural Center

The mission of the Basque & Cultural Center is to preserve, promote, and perpetuate Basque history and culture. It is the only Basque Museum in the United States. In 1985, the Museum was located in the Cyrus Jacobs-Uberuaga House at 607 Grove Street. The Museum expanded in 1993 to its current location at 611 Grove Street, which houses the Museum's exhibits, archives, collections, classrooms, and museum store.

Permanent and traveling exhibits treat visitors to the history of the Basques, including geography, native culture in the homeland, Basque immigration, occupational history, and many other aspects of Basque culture abroad, in Idaho, and the American West. The Museum has a large collection of artifacts, photographs, videos, and archival materials in its library, as well as an extensive oral history archive and audio collection. Many of the Museum's materials can be accessed through the museum's website, and by private appointment with Museum curators.

The Cyrus Jacobs-Uberuaga House at 607 Grove Street is Boise's oldest surviving brick residence. The small home is part of the Museum's property, nestled among a busy streetscape today. Its history began in 1864 when one of Boise's founding fathers, Cyrus Jacobs, built the home for his family. By 1910, the small house joined many other Basque boardinghouses in Boise. The Uberuaga family operated the boardinghouse from 1917 to 1969, where boarders enjoyed "home away from home" with familiar Basque language, food, dancing, music, and games. The Museum offers guided tours of the boardinghouse year-round. Special tours of the Museum and the Cyrus Jacobs-Uberuaga House can be arranged for groups at specified times or in conjunction with special events on the Basque Block.

The Basque Museum & Cultural Center also operates the Boiseko Ikastola, the only Basque language preschool outside the Basque Country. It is an accredited preschool where children of cultural backgrounds (Basque and non-Basque), learn to speak Euskara, the Basque language – which has no known origin and may possibly be one of the oldest languages in the world. The Museum also offers Basque language classes to adults on premises, and partners with academic institutions such as Boise State University, University of Idaho, University of Nevada-Reno, and many entities in the Basque Country on cultural, historic, and language educational efforts.

The Basque Museum & Cultural Center is a 501(c)(3) non-profit organization. Contributions are gratefully accepted and are tax-deductible. All members of the public, Basque and non-Basque, can help support the museum's mission through memberships, Museum Store purchases, contributions to special events, and individual or corporate donations.

PRESERVING, PROMOTING, AND PERPETUATING BASQUE CULTURE

611 Grove Street, Boise, Idaho 83702; 208-343-2671; www.basquemuseum.com
Hours: Tues – Fri 10:00 – 16:00; Sat – 11:00 – 15:00; Closed Sundays, Mondays and Holidays

Top Fuel 2016 Dinner: Basque Banquet

A Basque Banquet will be held Tuesday, September 13 on the Basque Block located near the Grove Hotel and Boise Centre. Beginning at 18:30, you can explore the Basque Block while enjoying light Pintxos (the Basque word for tapas) and try a Kalimotxo (red wine and cola) or frozen White Wine Sangria. Breathe in the smell of the giant paellas being prepared and maybe even take a tour of The Basque Museum and Cultural Center. The Museum will be open for tours of the Fronton (Basque hand ball court), historic boarding house, and their current exhibition until 20:00.

At 19:30, the Oinkaris (translates to fast feet) Basque Dancers will entertain the group with a dance that provides thrilling precision and enthusiasm. Watch, and maybe even join, the whirl of flying feet, snapping fingers, ancient music, and shouts of exhortation.

Dinner begins at 19:50. You will have had the chance to watch the creation of the beautiful paellas and have been tempted long enough with the delicious smells. Enjoy chicken, chorizo and seafood paella, vegetarian paella, mixed greens with Basque vinaigrette and freshly baked rolls.

Dinner includes a dessert buffet. One last taste of the Basque culture will include rich chocolate cream pudding, traditional arroz con leche and txikito (mini) melt in your mouth cookies.

The Basque block is within easy walking distance from the Boise Centre and The Grove Hotel. One ticket is included in each full registration. Additional tickets can be purchased at the meeting registration desk for $100.

Program Overview

Monday, September 12

7:00	Registration (Boise Centre, Summit Foyer)
7:00	Continental Breakfast (Boise Centre, Summit Foyer)
8:00	Opening Plenary (Boise Centre, Summit Auditorium)
9:30	Coffee Break (Boise Centre, Summit Foyer)
10:00	Plenary II (Boise Centre, Summit Room)
11:30	Lunch (on your own)
12:50	Technical Sessions (Boise Centre East)
15:20	Coffee Break (Boise Centre East, NW Lobby, Exhibit Area)
15:40	Technical Sessions (Boise Centre East)
18:30	Poster Session (Boise Centre East, Room 420)

Tuesday, September 13

7:00	Registration (Boise Centre East, 4th Floor)
7:00	Continental Breakfast (Boise Centre, Summit Foyer)
8:00	Special Session: ATF – Bringing Advanced Technologies into Risk Adverse Industry (Boise Centre, Summit Auditorium)
9:30	Coffee Break (Boise Centre East, NW Lobby, Exhibit Area)
10:00	Technical Sessions (Boise Centre East)
11:40	Lunch (on your own)
13:00	Technical Sessions (Boise Centre East)
14:30	Coffee Break (Boise Centre East, NW Lobby, Exhibit Area)
14:50	Technical Sessions (Boise Centre East)
18:30	Top Fuel 2016 Dinner: Basque Banquet (on the Basque Block, see page 15)
21:30	Banquet Concludes

Program Overview

Wednesday, September 14

7:00	Registration (Boise Centre East, 4th Floor)
7:00	Continental Breakfast (Boise Centre, Summit Foyer)
8:00	Special Session: Hydrogen Impacts in Zirconium Alloy Materials (Boise Centre, Summit Auditorium)
9:30	Coffee Break (Boise Centre East, NW Lobby, Exhibit Area)
10:00	Technical Sessions (Boise Centre East)
11:40	Lunch (on your own)
13:00	Technical Sessions (Boise Centre East)
14:30	Coffee Break (Boise Centre East, NW Lobby, Exhibit Area)
14:50	Technical Sessions (Boise Centre East)
18:20	Top Fuel 2016 Technical Program Adjourns

Thursday, September 15

6:30	INL Technical Tour – Bus Loading in Front of Grove Hotel
7:15	Bus Departs for the Idaho National Laboratory and Idaho Falls
8:00	BISON Workshop (Boise Centre East, Room 420B)
9:30	Coffee Break (Boise Centre East, NW Lobby)
10:00	BISON Workshop (Boise Centre East, Room 420B)
11:40	Lunch (on your own)
13:00	BISON Workshop (Boise Centre East, Room 420B)
14:30	Coffee Break (Boise Centre East, NW Lobby)
16:00	Workshop Adjourns

The NEA Expert Group on ATF for LWRs will hold a meeting Thursday, September 15, and Friday, September 16, beginning each day at 9:00 in Room 420A. Meeting space will be limited; Expert Group members will be given priority.

Technical Program Overview by Tracks

Track 1: Fuel Performance Reliability, Operations, and Maintenance Experience

T1-1	Fuel Performance Reliability and Operational Experience I	Wed. am
T1-2	Fuel Performance Reliability and Operational Experience II	Wed. pm
T1-3	Fuel Performance Reliability and Operational Experience III	Wed. pm

Track 2: Advances in Fuel Technologies (e.g., Enhanced Accident Tolerant Fuel)

T2-1	Overview of National ATF Programs	Mon. pm
T2-2	Industry Led Accident Tolerant Fuel Development	Mon. pm
T2-3	Accident Tolerant Fuel – Steel Claddings	Tues. am
T2-4	Accident Tolerant Fuel – Silicon Carbide Cladding	Tues. pm
T2-5	Advanced UOx -Zr Fuel Systems	Tues. pm
T2-6	Accident Tolerant Fuel – Advanced and Coated Cladding	Tues. pm
T2-7	Accident Tolerant Fuel Testing and Analysis	Wed. am
T2-8	Accident Tolerant Fuel – Uranium Silicide	Wed. pm
T2-9	Emerging Accident Tolerant Fuel Designs	Wed. pm

Track 3: Transient and Off-normal Fuel Behavior

T3-1	Off-Normal Fuel Behavior I	Mon. pm
T3-2	Off-Normal Fuel Behavior II	Mon. pm
T3-3	Transient Heat Transfer	Tues. am
T3-4	Fission Gas and Cladding Behavior	Tues. pm
T3-5	Off-Normal Fuel Behavior Integral Testing	Tues. pm

Track 4: Used Fuel Storage, Transportation, and Reuse/Recovery

T4-1	Used Fuel Storage, Transportation, and Reuse/Recovery I	Mon. pm
T4-2	Used Fuel Storage, Transportation, and Reuse/Recovery II	Mon. pm

Track 5: Fuel Modeling and Analysis

T5-1	Full Core Simulation	Tues. am
T5-2	Fuel Performance Codes I	Tues. pm
T5-3	Fuel Performance Codes II	Tues. pm
T5-4	Uncertainty Quantification and Validation	Wed. am
T5-5	Accident Analysis	Wed. pm
T5-6	Fundamental Modeling and Advanced Materials	Wed. pm

WRFPM 2017
2017 Water Reactor Fuel Performance Meeting

www.wrfpm2017.org

WRFPM 2017

2017 Water Reactor Fuel Performance Meeting

September 10-14, 2017
Ramada Plaza Jeju • Jeju Island, Korea

Important Dates

▪ Abstract Deadline	January 20, 2017
▪ Full Draft Paper Due	April 21, 2017
▪ Final Paper Due	July 14, 2017
▪ Early Registration Deadline	August 11, 2017

Technical Tracks

- Track 1 : Fuel Performance and Operational Experience
- Track 2 : Advances and Innovation in Fuel Technologies (e.g. Enhanced Accident Tolerant Fuel)
- Track 3 : Fuel Behaviors in Transients and Accident Conditions
- Track 4 : Spent Fuel Transportation, Storage and Treatment
- Track 5 : Fuel Modeling, Analysis and Methods

Abstract Submission Guidelines

All abstracts must be submitted via the official website of the WRFPM 2017 (www.wrfpm2017.org).

- **Length: Text min. 300 words ~ max. 500 words**
- **Figures and Tables: One figure and/or table maximum (if required)**
- **Language: English**

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Detailed Technical Program

Monday, September 12: Technical Program

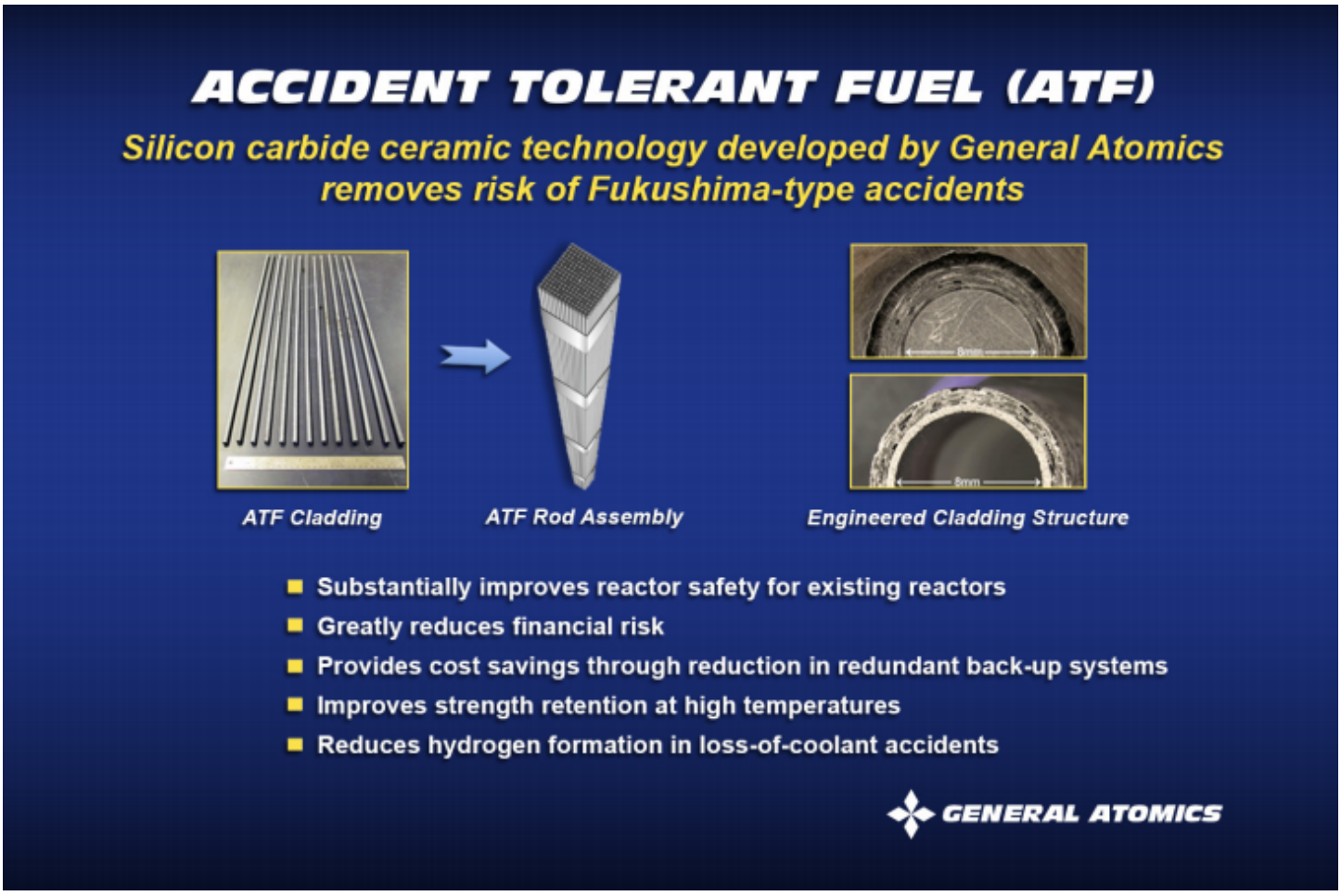
Opening Plenary
8:00 – 11:30

Location: Boise Centre, Summit Auditorium

The overall theme of Top Fuel 2016 is "LWR Fuels with Enhanced Safety and Performance." Following an opening address by the Lt. Governor of Idaho, Brad Little, the opening plenary will highlight thoughts and perspectives on this theme from leaders from across the world nuclear industry.

Moderator: Kemal Pasamehmetoglu - Idaho National Laboratory, Associate Lab Director

Panelists:
Brad Little - Lieutenant Governor of Idaho
John Kotek - DOE-NE-1, Acting Assistant Secretary for the Office of Nuclear Energy
Scot Greenlee - Exelon, Sr. V.P. of Engineering & Technical Industry Support
Yongjun Jiao - National Power Institute of China, Chief Expert of Nuclear Fuel
Margaret McGrath, IFE/Halden, Halden Project Manager/Market Director



Monday, September 12
12:50 - 15:20

Track 2: Advances in Fuel Technologies (e.g., Enhanced Accident Tolerant Fuel)

T2-1: Overview of National ATF Programs
Location: Boise Centre East, Room 410A/B
Session Chairs: Sumit Ray (Westinghouse) and William Gassmann (Exelon)

12:50 OECD Nuclear Energy Agency's Collaborative Research Activities on Nuclear Materials
Simone Massara

13:15 Utilization of the Halden Reactor for Supporting Development of Fuel with Enhanced Accident Tolerance
M.A. McGrath, P. Bennett, H. Thoresen

13:40 Overview of the U.S. DOE Advance Fuels Campaign
William McCaughey, Frank Goldner, W. Jon Carmack, Shannon M. Bragg-Sitton

14:05 Establishment of Technical Basis to Implement Accident Tolerant Fuels and Components To Existing LWRs
Schinichiro Yamashita, Fumihisa Nagase, Masaki Kurata, Yoshiyuki Kaji

14:30 Manufacturability of U_3Si_2 and its High Temperature Oxidation Behavior
David T. Goddard, Daniel P. Mathers, David G. Eaves, Peng Xu, Edward J. Lahoda, Jason M. Harp

14:55 Overview of the Experiments Performed with Russian Claddings at MTAEK
M. Király, Z. Hózer, D. M. Antók, M. Horváth, I. Nagy, R. Nagy, T. Novotny, E. Perez-Feró, N. Vér

Monday, September 12
12:50 - 15:20

Track 3: Off-Normal Fuel Behavior

T3-1: Off-Normal Fuel Behavior I
Location: Boise Centre East, Room 410C
Session Chairs: Vincenzo Rondinella (ITU) and Robert Montgomery (PNNL)

12:50 Behavior of High-Burnup Advanced LWR Fuels under Accident Conditions
M. Amaya, Y. Udagawa, T. Narukawa, T.Miihara, Y.Taniguchi

13:15 INL Transient Reactor Restart Progress
John D. Bumgardner

13:40 Capabilities Development for Transient Testing of Advanced Nuclear Fuels at TREAT
N.E. Woolstenhulme, C.C. Baker, J D. Bess, C.B. Davis, C.M. Hill, G.K.Housley, C.B. Jensen, N.D. Jerred, R.C. O'Brien, S.D. Snow, D.M. Wachs

14:05 A Progress Update on Selected AREVA NP Advanced BWR Methodologies
Kevin S. Quick, Dan Tinkler, Robert Schnepp, Lisa Charlot, Tom Ellger, Yousef Farawila

14:30 Fuel Hardware Considerations for BWR PCI Mitigation
Johathan Wright, Clara Anghel, Simon Middleburgh, *Magnus Limbäck*

14:55 MEXIICO: A New Equipment to Study the Pressure Impact on the Irradiated Fuel Behavior
E. Hanus, P.P. Malgouyres, S. Clément, R. Alloncle, M. Pontillon, S. Bernard, B. Gleizes, R. Masson, Y. Pontillon, J. Noirot

Monday, September 12
12:50 - 15:20

Track 4: Used Fuel Storage, Transportation, and Reuse/Recovery

T4-1: Used Fuel Storage, Transportation, and Reuse/Recovery I
Location: Boise Centre East, Room 430A/B
Session Chairs: Gary Lanthrum (NAC International) and Linus Bettermann (GNS)

12:50 Special Presentation: Overview of IAEA Ongoing Activities
Mikhail Veshchunov

13:15 The Fuel Integrity Analysis of Transfer Processes for Chinshan Dry-Storage System By FRAPTRAN/CFD
Wan-Yun Li, Jong Rong Wang, Yung-Shin Tseng, Wan-June Chiu, Hao-Tzu Lin, Jung-Hua Yang, Shao-Wen Chen, Chunkuan Shih

13:40 Experimental Test Plan for PWR Sister Rods in the High Burnup Spent Fuel Data Project
Rosemary Montgomery, John M. Scaglione, Bruce Bevard, Brady Hanson, Mike Billone

14:05 Determination of the Mechanical Properties of Blisters by Nano Indentation
M.A. Martin Rengal, F.J. Gomez-Sanchez, A. Rico, J. Ruis-Hervias, J. Rodriguez

14:30 Corrosion Test of LWR Cladding Tubes in High Temperature Seawater
Takashi Sawabe, Takeshi Sonoda, Shoichi Kitajima

14:55 CASTOR® V Casks: Quivers for Damages Fuel Rods
Thomas Funke, Roldan Hüggenberg, Amin Bannani, Wojciech Cebula

Monday, September 12
15:40 – 18:10

Track 2: Advances in Fuel Technologies (e.g., Enhanced Accident Tolerant Fuel)

T2-2: Industry Led Accident Tolerant Fuel Development
Location: Boise Centre East, Room 410A/B
Session Chairs: Simone Massara (OECD/NEA) and Margaret McGrath (IFE/Halden)

15:40 Development of Accident Tolerant Control Rod for Light Waters Reactors
Hirokazu Ohta, Kinya Nakamura, Takanari Ogata, Fumihisa Nagase

16:05 AREVA Enhanced Accident Tolerant Fuel Program – Current Results and Future Plans
N.A.P. Kiran Kumar, J.N. Stevens, M. Savela, M. Bays, J.H. Strumpell

16:30 Progress of GE Development of Accident Tolerant Fuel FeCrAl Cladding
Russell E. Stachowski, Raul B. Rebak, William P. Gassmann, John Williams

16:55 SiC Cladding Corrosion and Mitigation
Ed Lahoda, Frank Boylan, Sumit Ray, Peng Xu, Richard Jacko

17:20 Accident-Tolerant Fuel: Quantifying Relative Risks and Timescales in Severe Accidents
Romney B. Duffey

17:45 Fabrication of Rodlets with Coated Lined Mo-Alloy Cladding for Testing and Irradiation
Bo Cheng, Young-Jin Kim, Sam Armijo, Peter Chou, Cem Topbasi, Chuong Do, Peter Ring

Monday, September 12
15:40 – 18:10

Track 3: Transient and Off-Normal Fuel Behavior

T3-2: Off-Normal Fuel Behavior II
Location: Boise Centre East, Room 410C
Session Chairs: Ping Chen (NPIC) and Per Magnusson (Studsvik)

15:40 OECD RIA Benchmark Phase II –Towards a Better Understanding of the RIA Fuel Modelling
Olivier Marchand, Jinzhao Zhang, Marco Cherubini

16:05 Analyses of SPERT-CDC Test 859 by FEMAXI-7 and RANNS Codes
Yoshinori Taniguchi, Yutaka Udagawa, Masaki Amaya

16:30 BISON Modeling of Reactivity-Initiated Accident Experiments in a Static Environment
Charles P. Folsom, Colby B. Jensen, Richard L. Williamson, Nicolas E, Woolstenhulme, Heng Ban, Daniel M. Wachs

16:55 Integrated Analytical Method to Demonstrate 10 CFR 50.46c Compliance
*Jeffrey R. Kobelak, Michael A. Shock*ing

17:20 The Application of Mammoth for a Detailed Tightly Coupled Fuel Pin Simulation with a Station Blackout
Frederick Gleicher, Javier Ortensi, Mark DeHart, Yaqi Wang, Sebastian Schunert, Stephen Novascone, Jason Hales, Richard Williamson, Andrew Slaughter, Cody Permann, David Andrs, Richard Martineau

17:45 Reactivity Initiated Accident Simulation to Inform Transient Testing of Candidate Advanced Cladding
Nicholas R. Brown, Aaron J. Wysocki, Kurt A. Terrani

Monday, September 12
15:40 – 18:10

Track 4: Used Fuel Storage, Transportation, and Reuse/Recovery

T4-2: Used Fuel Storage, Transportation, and Reuse/Recovery II
Location: Boise Centre East, Room 430A/B
Session Chairs: Rich Ridder (Dominion) and Robert Einziger (NWTRB)

15:40 A Hydride Reorientation Model for Irradiated Zirconium Alloy Cladding
Wenfeng Liu, Joe Rashid, Albert Machiels

16:05 Quantification of Reactivity Margin in BWR Spent Fuel Pools
John Hannah, Kristin Bennett

16:30 Modeling Used Fuel Response to Normal Conditions of Transportation Package Drops to Assess Geometric Sensitivities
Nicholas A. Klymyshyn, Philip J. Jensen, Nathan P. Barrett

16:55 Used Fuel Transportation Considerations to Support Centralized Interim Storage
J. Gary Lanthrum, Juan Subiry

17:20 Going for Complete Defueling - A Comprehensive Solution for Damaged Spent Fuel
L. Betterman, M. Kaplik, A. Bannini, T. Funke

Monday, September 12
18:30-20:00

Poster Session
Session Chairs: Lori Braase (INL), Russell Gardner (INL)
Location: Boise Centre East, Room 420A/B

*Light Appetizers and Drinks will be served

Track 1: Fuel Performance Reliability, Operations, and Maintenance Experience

Synchrotron XRD Analysis of Irradiated UO_2 Fuel at Various Burn-Ups
Mélanie Chollet, Goutam Kuri, Daniel Grolimund, Matthias Martin, Johannes Bertsch

Progress in Developing Laser Based Post Irradiation Examination Infrastructure
James A. Smith, Clark L. Scott, Brad C. Benefiel

Wireless In-Core Acoustic Telemetry and Self-Powered Sensing
James A. Smith, Steven L. Garrett, Michael D. Heibel, Vivek J. Agarwal, Brenden J. Heidrich

Electron Microscopy Analysis of High Burnup Commercial UO_2 Fuel
Tyler J. Gerczak, Charles A. Baldwin, Philip D. Edmondson, Chad M. Parish, Kurt A. Terrani

Monday, September 12
18:30-20:00

Poster Session

Track 2: Advances in Fuel Technologies (e.g., Enhanced Accident Tolerant Fuel)

Fuel Design Concept to Stabilize Boiling Water Reactors
Yousef M. Farawila

An Advanced Materials Irradiation Facility for Materials and Fuels Irradiation at the High Flux Isotope Reactor
Nesrin O. Cetiner, Graydon L. Yoder, Joel L. McDuffee, Don Wilder, Young Soo Kwon, Chris Bryan

Hydraulic Performance Evaluation of Rod Bundle with a Concept Spacer Grid Design
Zhiwei Lu, Tong Liu

GNF Fuel Technology Update
Paul E. Cantonwine, Patricia McCumbee, Kathryn Martin, Kevin Ledford, Dan Lutz, Russell Fawcett, Myles Connor, Sarah Desilva

Ion Irradiation of ZIRLO® Alloy
Djamel Kaoumi, Anand M. Garde, Guirong Pan

U.S. Implementation of Q12™ Zirconium Alloy for Improved Dimensional Stability of Structural Components
J.N. Stevens, V. Chabretou, S. Trapp-Pritsching

NDMAS Implementation and Data Qualification for Accident Tolerant Fuel Experiments
L.C. Hull, K.E. Barrett, N.J. Lybeck, N. Johnson, S.G. Galbraith, G.M. Core, H.J.M. Chichester

Measurement of Thermal Gap Conductance Using the Laser Flash Method
Zhuorui Song, Luke Scoggins, Chris Martinez, Heng Ban, Pavel Medvedev

Advanced Synthesis for Enhanced Accident Tolerance of LWR Cladding Materials
Abdellatif M. Yacout, Michael Pellin, Sumit Bhattacharya

In-Pile Investigation Results of Re-Sintering for Uranium Dioxide Fuel with Large Grain Size at Temperature 650-700°C
E.N. Mikheev, A.V. Fedotov, N.M. Rysev, V.V. Novikov, O.A. Bakhteev, V.B. Malygin, A.L. Izhutov, A.V. Burukin, S.V. Seredkin, G.A. Ilyinykh

Preliminary Analysis of Core Heat-up for ATFs under Accident Conditions
Wei Li, Ping Chen, Guanghui Su, Suizheng Qiu, Wenxi Tian, Wenjie Li

Monday, September 12
18:30-20:00

Poster Session

Track 3: Transient Off-Normal Fuel Behavior

The Ultimate Response Guideline Simulation and Analysis by Using TRACE/FRAPTRAN for Chinshan Nuclear Power Plant
Jong-Rong Wang, Yung-Shin Tseng, Wan-Yun Li, Jung-Hua Yang, Hao-Tzu Lin, Hsiung-Chih Chen, Shao-Wen Chen, Chunkuan Shih, Show-Chyuan Chiang, Tzu-Yao Yu

Performance of U_3Si_2 Fuel in a Reactivity Insertion Accident
Lap-Yan Cheng, Arantxa Cuadra, Michael Todosow, Kyle A. Gamble, Pavel G. Medvedev

Influence of Pre-Hydriding and Quench on Embrittlement of E110 Alloy under LOCA Conditions
Vladimir V. Novikov, Vladimir I. Kuznetsov, Petr V. Fedotov, Alexander V. Salatov, Dmitrii N. Ignatiev, Andrey A. Mokrushin, Dmitrii M. Soldatkin, Alexander A. Urusov

Secondary Creep Behavior of Zr-4 Claddings under LOCA Conditions
Damien Campello, Nicolas Tardif, M.C. Baietto, Michel Coret, Jean Desquines

AREVA NP M5® Cladding Benefits for Proposed US NRC RIA and LOCA Requirements
V. Garat, C. Ly, J.P. Mardon, L. Gerken, D. Deveney, D. Deuble

Performance of Waterlogged LWR Fuel during RIA
Daniel M. Wachs

Monday, September 12
18:30-20:00

Poster Session

Track 4: Used Fuel Storage, Transportation, and Reuse/Recovery

Spent Nuclear Fuel Dynamic Performance under Normal Condition of Transport
Jy-An Wang, Hong Wang, Hao Jiang, Yong Yan, Bruce Bevard

Micro Arc Oxidation of Aluminum for Nuclear Applications
Hadas Abir, Inbar Dag, Agnes Pivnik, Matthew Eyre

A Study on the Assessment Criteria of DHC in PWR Spent Fuel
J.-D. Hong, J.-S. Kim, .Y.-S. Yang, H.-C. Kim, Y.-H. Koo

Mechanical Testing of Hydrided Fuel Cladding
Rick Shimskey, Philip Jensen, Paul MacFarlan, Leigh Lin, Brady Hanson

Monday, September 12
18:30-20:00

Poster Session

Track 5: Fuel Modeling and Analysis

Research Reactor Plate Fuel Multiphysics Hotspot Model for the HFIR
Michael J. Richards, Arthur E. Ruggles, James D. Freels

Determination of Water Equivalent Content in Fuel Rods
Hong Xu, Changyou Chen

Finite Element Analysis of the PWR Control Rod Absorber Thermal Evaluation
Bin Zhang, Yongjun Deng, Xin Jin, Yang Wang

JASMINE: A Fuel Rod Thermal-Mechanical Performance Code
Xin Jin, Xiaoyan Wei, Xiaohan Liu, Yongjun Deng

TREAT Neutronics Analysis and Design Support, Part II: Multi-SERTTA-CAL
John D. Bess, Nicolas E. Woolstenhulme, Connie M. Hill, Spencer D. Snow, Colby B. Jensen

CYRANO3 the EDF Fuel Code Performance: Global Overview and Recent Developments on MOX Fuel
Rodrigue Largenton, Charles Petry, Karine Audic, Fabrice Douchin

TREAT Neutronics Analysis of Water-Loop Concept Accommodating LWR 9-Rod Bundle
Connie M. Hill, Nicolas E. Woolstenhulme, James R. Parry, John D. Bess, Gregory K. Housley

New Developments in ALCYONE 2.0 Fuel Performance Code
Vincent Marelle, Patrick Goldbronn, Stéphane Bernaud, Etienne Castelier, Jérôme Julien, Katherine Nkonga, Laurence Noirot, Isabelle Ramière

Investigation of Shot Peening Residual Stress on Alloy 718 Leaf Springs for Primary Water Stress Corrosion Cracking Analysis
Zachary I. Charlton, C. Joseph Long, Matthew J. Schmid

Verification of the Pin Power Reconstruction Method in NESTLE
Nicholas P. Luciano, G. Ivan Maldonado

Nuclear Activation, Chemical Kinetics and Hydraulics System Analysis of a Borated Flow Loop
Douglas Crawford, Wilson Cowherd, Joe Shaw, Brian P. Durtschi, Kristine E. Barrett

Research on Subchannel Resistance Coefficient Calculation Based on CFD Methodology
Xi Chen, Sijia Du, Hon Zhang

Tuesday, September 13: Technical Program

Special Session: ATF - Bringing Advanced Technologies into Risk Adverse Industry
8:00 – 9:30

Location: Boise Centre, Summit Auditorium

This panel session will provide a discussion of the challenges associated with bringing new advanced technologies into a risk adverse industry. A selection of participants from key U.S. regulatory agencies, including United States Nuclear Regulatory Committee and United States Federal Aviation Administration, are committed to discussing this topic with a selection of participants from across the nuclear industry and the audience.

Moderators: Jon Carmack – Idaho National Laboratory, John Strumpell – AREVA Inc.

Panelists:
Kris Cummings - Nuclear Energy Institute
Michelle Bales - Nuclear Regulatory Commission
Mark Freisthler - Federal Aviation Administration
Amir Afzali - Southern Company

Tuesday, September 13
10:00 – 11:40

Track 2: Advances in Fuel Technologies (e.g., Enhanced Accident Tolerant Fuel)

T2-3: Accident Tolerant Fuel – Steel Claddings
Location: Boise Centre East, Room 420A/B
Session Chairs: Bill McCaughey (US-DOE) and Nicholas Satter (Southern Co.)

10:00 Development of Ce-Type FeCrAl-ODS Ferritic Steel to Accident Tolerant Fuel for BWRs
K. Sakamoto, A. Ouchi, A. Suzuki, T. Higuchi, M. Hirai, N. Oono, S. Ukai

10:25 Development of FeCrAl-ODS Steels for ATF Cladding
Shigeharu Ukai, Naoko Oono, Satoshi Ohtsuka, Takeji Kaito, Kan Sakamoto, Tadahiko Torimaru, Akihiko Kimura, Shigenari Hayashi

10:50 Overview of the Multifaceted Activities towards Development and Deployment of Nuclear-Grade FeCrAl Alloys
Kevin G. Field, Yukinori Yamamoto, Bruce A. Pint. Kurt A. Terrani

11:15 Fabrication of FeCrAl Cladding for Accident Tolerant Fuel
Raul B. Rebak, Younk-Jin Kim, Jonas Gynnerstedt, Kurt A. Terrani, Russell E. Stachowski

Tuesday, September 13
10:00 – 11:40

Track 3: Transient and Off-Normal Fuel Behavior

T3-3: Transient Heat Transfer
Location: Boise Centre East, Room 410C
Session Chairs: Masaki Amaya (JAEA) and Kurt Terrani (ORNL)

10:00 Clad to Coolant Heat Transfer during RIA in PWR Conditions
Pierre Ruyer

10:25 Critical Heat Flux Impact Due to Cladding Surface Condition
William A. Byers, Guoqiang Wang, Zeses E. Karoutas, Bren Phillips

10:50 Thermal-Hydraulic Performance of the TREAT Multi-SERTTA for Reactivity Initiated Accident Experiments
Colby B. Jensen, Charles P. Folsom, Cliff B. Davis, Nicolas E. Woolstenhulme, John D. Bess, Robert C. O'Brien, Heng Ban, Daniel M. Wachs

11:15 Fiber Optic Instrumentation for Nuclear Fuels and Materials Irradiations
Christian M. Petrie

Tuesday, September 13
10:00 – 11:40

Track 5: Fuel Modeling and Analysis

T5-1: Full Core Simulation
Location: Boise Centre East, Room 410A/B
Session Chairs: Rose Montgomery (ORNL) and Chris Stanek (LANL)

10:00 ARCADIA® and Advanced Methods Licensing and Implementation Update
Florin Curca-Tivig

10:25 Development of an Advanced Multiscale Subchannel Model for CRUD Risk Assessments
Ryan T. Swanson, John H. Jones, John R. Supernaw, Dr. Lanfranco Monti, Dr. Galina Sieber

10:50 Assessing Pellet-Clad Interaction with VERA: WBN1, Cycles 6-7*
Shane G. Stimpson, Kevin T. Clarno, Jeffrey J. Powers, Roger P. Pawlowski

11:15 Using Falcon to Develop RIA PCMI Failure Criteria
John Alvis, William Lyon, Ken Yueh

Tuesday, September 13
13:00 – 15:30

Track 2: Advances in Fuel Technologies (e.g., Enhanced Accident Tolerant Fuel)

T2-4: Accident Tolerant Fuel – Silicon Carbide Cladding
Location: Boise Centre East, Room 420A/B
Session Chairs: Peng Xu (Westinghouse) and Masaki Kurata (JAEA)

13:00 Radiation Tolerant Joining for Silicon Carbide-Based Accident Tolerant Fuel Cladding
Hesham E. Khalifa, Jonathon D. Sheeder, George M. Jacobsen, Christian P. Deck

13:25 Development of Joining Technology Using Local Heating for SiC Fuel Cladding
Ryo Ishibashi, Yoshiyuki Takamori, Xudong Zhang, Takao Kondo, Katsumasa Miyazaki

13:50 Progress on ATF Development of SiC for LWR
Kazuo Kakiuchi, Kazunari Okonogi, Masayuki Uchihashi, Masaru Ukai, Fumie Sebe, Yutaka Takeuchi, Takuya Ogawa, Hiroshi Matsumiya, Shoko Suyama

14:15 Irradiation – High Heat Flux Synergism in Silicon Carbide-Based Fuel Claddings for Light Water Reactors
Yutai Katoh, Kurt A. Terrani, Takaaki Koyanagi, Christian M. Petrie, Gyanender Singh, Lance L. Snead, Christian Deck

14:40 All SiC/SiC Cladding Irradiation in LWR Environments
Joon-Soo Park, Daisuke Hayasaka, Naofumi Nakazato, Hirotatsu Kishimoto, Akira Kohyama

15:05 Characterization of SiC-SiC Accident Tolerant Fuel Cladding after Stress Application
Carlos F. Bacalski, George M. Jacobsen, Christian P. Deck

Tuesday, September 13
13:00 – 15:30

Track 3: Transient and Off-Normal Fuel Behavior

T3-4: Fission Gas and Cladding Behavior
Location: Boise Centre East, Room 410C
Session Chairs: Marc Petit (IRSN) and Zeses Karoutas (Westinghouse)

13:00 A Study of Transient FGR by Integral LOCA Tests
Per Magnusson, Carl Adamsson, Daniel Jädernäs, Gunnar Rönnberg, David Schrire, Anna Alvestav, Marcus Seidl

13:25 Boron Effects on Fission Product Behavior under Severe Accident Conditions
S. Miwa, F.G Di Lemma, K. Nakajima, M.Osaka

13:50 Nuclear Fuel Behavior at High Temperature: New Insights from Post-Test Examinations on the Verdon-1 Sample
A. Gallais-During, E. Geiger, C. Le Gall, J. Lamontagne, S. Bernard, B. Gleizes, Y. Pontillon, E. Hanus, G. Ducros

14:15 The PROMETRO Program: Plane Strain Tests on Fresh and Highly Irradiated Zircaloy-4, ZIRLO®, and M5™ Fuel Claddings
Bernard Cazalis, Jean Desquines, Thomas Le Jolu, Christian Bernaudat

14:40 Fuel Cladding Post-Quench LOCA Embrittlement: Mechanical Test Relevance
Séverine Guilbert-Banti, Jean Desquines

15:05 Breakaway Oxidation of ZIRLO® and Optimized ZIRLO™ Cladding per 10CFR50.46c Criteria
Andrew R. Atwood, Andrew J. Mueller, Guirong Pan, David Mitchell

Tuesday, September 13
13:00 – 15:30

Track 5: Fuel Modeling and Analysis

T5-2: Fuel Performance Codes I
Location: Boise Centre East, Room 410A/B
Session Chairs: Norman Garner (AREVA) and Dan Mathers (NNL)

13:00 Calibration and Validation of NRC Fuel Performance Models
Kenneth J. Geelhood

13:25 Advances in Westinghouse Fuel Rod Design Technology (PAD5)
Yun Long, Paul J. Kersting, Otto Linsuain, David T.Rumschlag, Robert L. Oelrich Jr.

13:50 Pellet cladding Mechanical Interaction Modeling Using the Extended Finite Element Method
Benjamin W. Spencer, Wen Jiang, John E. Dolbow

14:15 PCI Analysis of a Commercial PWR Using Bison Fuel Performance Code
Nathan Capps, Robert Montgomery, Dion Sunderland, Brian D. Wirth

14:40 PCI Margin Analysis Methodology Using the Falcon Fuel Performance Code
Michael W. Kennard, William F. Lyon, Anh T.Mai

15:05 Modified Versions of the Fuel Performance Codes RTOP and RTOP-CA
V.V. Likhanskii, I.A. Evdokimov, V.G. Zborovskii, A.A. Sorokin, S.A. Tokarev, O.V. Vilkhivskaya

Tuesday, September 13
15:50 – 18:20

Track 2: Advances in Fuel Technologies (e.g., Enhanced Accident Tolerant Fuel)

T2-5: Advanced UOx-Zr Fuel Systems
Location: Boise Centre East, Room 420B
Session Chairs: Michelle Bales (NRC) and Yongjun Jiao (NPIC)

15:50 Effect of Carbon Impurity During the Sintering of MOX Fuels
S. Vaudez, C. Marlot, F. Lebreton, C. Chambon

16:15 TRITON11™ - Westinghouse 11 X 11 BWR Fuel Design
Uffe C. Bergmann, Jeremy King

16:40 ATRIUM™ 11 Operating Experience
Steven E. Cole, Norman Garner, Stephen Mazurkiewicz, Volder Schoss, Pierre Mollard

17:05 Manufacture of Large Grain Size of Gd_2O_3-UO_2 Pellets Adding $Al(OH)_3$
Li Xiang, Dai Jianxiong, Li Haitao

17:30 Study of the U_3O_8 Effect on MOX Fuel Sintering Mechanisms
C. Chambon, S. Vaudez, J-M. Heintz

17:55 Reactor Lifetime Extension by Limiting the RPV Fluence Increase
D. Porsch, Ch. Moellmer, J. Peucker, J. Plancher, K.Segard

Tuesday, September 13
15:50 – 18:20

Track 3: Transient and Off-Normal Fuel Behavior

T3-5: Off-Normal Fuel Behavior Integral Testing
Location: Boise Centre East, Room 410C
Session Chairs: Colby Jensen (INL) and Andrew Atwood (Westinghouse)

15:50 Control Blade Degradation Test under Temperature Gradient in Steam Atmosphere
Hiroki Shibata, Kazuyuki Tokushima, Kan Sakamoto, Masaki Kurata

16:15 Inspection of a LOCA Test Rod at the Halden Reactor Project Using Gamma Emission Tomography
Peter *Andersson, Scott Holcombe, Terje Tverberg*

16:40 Corium Stratification Test Using Intermediate Products of Degraded Core Materials in Severe Accident of BWR
Kazuyuki Tokushima, Noriko Shirasu, Kuniyoshi Hoshino, Hiroshi Ohara, Masaki Kurata

17:05 Oxidation Behavior of Zry-4 in Steam-Air Mixtures at High Temperatures
Martin Negyesi, Masaki Amaya

17:30 In Situ Synthesis and Characterization of Uranium Carbide Using High Temperature Neutron Diffraction
H. Matthias Reiche, Sven C. Vogel

17:55 TREAT Reactor LEU Fuel-Clad Chemical Interation Empirical Modeling Analysis
C.J. Parga, I.J. van Rooyen, M.V. Glazoff, E.P. Luther

Tuesday, September 13
15:50 – 18:20

Track 5: Fuel Modeling and Analysis

T5-3: Fuel Performance Codes II
Location: Boise Centre East, Room 410A/B
Session Chairs: Ed Lahoda (Westinghouse) and Ian Porter (NRC)

15:50 Method Advancements for Fuel Assessments during Seismic and LOCA Events
Scott Adair, Pascal Descot, Victor Hatman, Hannes Kessler, Szilard Kovacs, Brett Matthews

16:15 Simulation Methodology for Fuel Assembly Drop Accident during Handling
Yuriy Aleshin, Alberto Cerracin, Nam-Gyu Park, Young-lk-Yoo

16:40 Statistical and Sensitivity Analysis of Failing Rods in EPR LB-LOCA
Asko Arkoma, Timo Ikonen

17:05 Seismic and LOCA Safety Testing and Analysis Program for Westinghouse PWR Fuel Under End of Life Conditions
R.Y. Lu, N.E. Marshall, J.X. Jiang, P.M. Evans, J. Wang, C. Wood, J. Liu

17:30 Full Core LOCA Analysis for BWR/6 – Methodology and First Results
C. Cozzo, A. Epiney, S. Canepa, H. Ferroukhi, O. Zerkak, G. Khvostov, V. Brankov, A. Gorzel

17:55 Transient Performance of Accident Tolerant Fuel in Design Basis Accidents
Lap Y. Cheng, Arantxa Cuadra, Nicholas Brown, Michael Todosow

Tuesday, September 13
15:50 – 18:20

Track 2: Advances in Fuel Technologies (e.g., Enhanced Accident Tolerant Fuel)

T2-6: Accident Tolerant Fuel – Advanced and Coated Cladding
Location: Boise Centre East, Room 420A
Session Chairs: Veronique Rebeyrolle (AREVA) AND Raul Rebek (GE)

15:50 Development of Surface Modified Zr Cladding by Coating Technology for ATF
Hyun-Gil Kim, Il-Hyun Kim, Yang-Il Jung, Dong-Jun Park, Jae-Ho Yang, Yang-Hyun Koo

16:15 Development of Cr-Coated Zirconium Alloy Cladding for Enhanced Accident Tolerance
Jeremy Bischoff, Christine Vauglin, Christine Delafoy, Pierre Barberis, Delphine Perche, Bernard Guerin, Jean-Paul Vassault, Jean-Christophe Brachet,

16:40 Behavior under LOCA Conditions of Enhanced Accident Tolerant Chromium Coated Zircaloy-4 Claddings
J.C. Brachet, M. Le Saux, V. Lezaud-Chaillioux, M. Dumerval, Q. Houmaire, F. Lomello, F. Schuster, E. Monsifrot, J. Bischoff, E. Pouillier

17:05 Property Analysis and Advanced Manufacturing Technique Development for Light Water Reactor Annular Composite Fuel
Juliusz A. Kruszelnicki, Patrick Moo, Jhonathan Rosales, Ghatu Subhash, James Tulenko

17:30 Corrosion Resistant Coatings for Zirconium-Alloy Cladding with Improved Accident Tolerance
Peng Xu, Edward J. Lahoda, Sumit Ray, Jonna M. Partezana, Kumar Sridharan, Douglas E. Wolfe

17:55 Preparation of Liquid Fuel Test Rig in Halden HBWR
Motoyasu Kinoshita, Fumihiro Chiba, Takashi Watanabe, Tsuyoshi Iwashita, Kazuro Furukawa, Masaaki Furukawa, Christian Hartmann, Jon-Martin Karlsen, William Beere, Jørn-Harald Hansen, Yoji Minagawa, Margaret McGrath

18:30

Top Fuel 2016 Dinner

The Top Fuel Basque Banquet will be held outside on the Basque Block, Downtown Boise.

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Construction, Manufacturing & Overhaul Engineering

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Wednesday, September 14: Technical Program

Special Session - Hydrogen Impacts in Zirconium Alloy Materials
8:00 – 9:30

Location: Boise Centre, Summit Auditorium

The objective of this panel is to review the current state of understanding hydrogen impacts in zirconium alloys and to identify strategic gaps to help focus industry's limited resources on the right research areas that can advance the industry's goal of safe, cost-effective nuclear power. We plan to review a number of issues (loss of coolant accident, reactivity initiated accident, distortion, hydrogen cracking, accelerated corrosion, and dry cask storage and transportation) that are affected by hydrogen. Invited panelists will address key open questions with respect to hydrogen in zirconium-based alloys.

Moderator: Erik Mader – EPRI

Panelists:
Ron Adamson - Consultant
Albert Machiels - EPRI
David Schrire - Vattenfall
Aylin Kucuk - EPRI
Ioan Arimescu - AREVA

Wednesday, September 14
10:00 – 11:40

Track 2: Advances in Fuel Technologies (e.g., Enhanced Accident Tolerant Fuel)

T2-7: Accident Tolerant Fuel Testing and Analysis
Location: Boise Centre East, Room 420A/B
Session Chairs: Mikhail Veshchunov (IAEA) and Mitchell Meyer (INL)

10:00 Phased Development of Accident Tolerant Fuel
Shannon M. Bragg-Sitton, W. Jon Carmack

10:25 Fuel Cycle Impacts of Accident Tolerant Fuels
Michael Todosow, Arantxa Cuadra, Nicholas Brown, Gilad Raitses, Andrew Worrall, Jeffrey Powers, Robert Jubin, Temitope Taiwo, Taek Kim, Ting Fei, Nicolas Stauff, Roald Wigeland, Brent Dixon

10:50 Experimental Evaluation of the High Temperature Thermo-Physical Properties of UO_2
T. Pablov, L. Vlahovic, D. Staicu, R.J.M. Konings, M.R. Wenman, R.W. Grimes, P. Van Uffelen

11:15 High Temperature Oxidaton of PCD Coated Zr Alloy
Jan Škarohlíd, Radek Škoda, Irena Kratochvílová

Wednesday, September 14
10:00 – 11:40

Track 1: Fuel Performance Reliability, Operations, and Maintenance Experience

T1-1: Fuel Performance Reliability and Operational Experience I
Location: Boise Centre East Room 410C
Session Chairs: Patty McCumbee (GNF) and Aylin Kucuk (EPRI)

10:00 Effect of Precipitates in Oxide Film on Hydrogen Pick-Up of Zirconium Alloys
Katsuhito Takahashi, Tomio Iwasaki, Yusaku Maruno

10:25 Effect of pH on Hydrogen Pick-Up and Corrosion in Zircaloy-4
James Sayers, Sergio Lozano-Perez, Susan Ortner

10:50 Z4B™, AREVA NP's Most Recent Material for Structural Fuel Assembly Components
Andreas Moeckel, Kevin Mon, Volker Schoss, Petra Britt Hoffmann, Steven Cole, Norman Garner

11:15 Advantages Gained by Optimized ZIRLO™ and AXIOM™ PWR Cladding Materials
Guirong Pan, David B. Mitchell, Anand M. Garde, Jeffery L. Norrell, Andrew R. Atwood, Magnus Limbäck

Wednesday, September 14
10:00 – 11:40

Track 5: Fuel Modeling and Analysis

T5-4: Uncertainty Quantification and Validation
Location: Boise Centre East, Room 410A/B
Session Chairs: Jason Hales (INL) and Marie Moatti (EDF)

10:00 Uncertainty Quantification and Sensitivity Analysis Applications to Fuel Performance Modeling
Kyle A. Gamble, Laura P. Swiler

10:25 Uncertainty Evaluation for the Realistic Safety Analysis Methodology of RIA by Utilizing Experimental Results
Joosuk Lee

10:50 Treatment of the Uncertainties in Fuel Rod Design Analysis
Jan Klouzal, Martin Dostál, Vitězslav Matocha

11:15 TREAT Neutronics Analysis and Design Support, Part I: Multi-SERTTA
John D. Bess, Nicolas E. Woolstenhulme, Connie M. Hill, Colby B. Jensen, Spencer D. Snow

Wednesday, September 14
13:00 – 15:30

Track 2: Advances in Fuel Technologies (e.g., Enhanced Accident Tolerant Fuel)

T2-8: Accident Tolerant Fuels – Uranium Silicide
Location: Boise Centre East, Room 420A/B
Session Chairs: Michael Todosow (BNL) and Jeremy Bischoff (AREVA)

13:00 Fabrication of Advanced Accident Tolerant U-Si Fuel Forms
Stewart Voit, Joshua White, Darrin Byler, John Dunwoody, Pavel Medvedev, Chris Glass, Andrew Nelson, Kenneth McClellan

13:25 Corrosion and Interdiffusion Studies of U_3Si_2
Jason M. Harp, Lingfeng He, Rita E. Hoggan, Adrian R. Wagner

13:50 Current Status of Postirradiation Examination for the ATF-1 Irradiation
Jason M. Harp, Heather J.M. Chichester

14:15 The Synthesis and Air Oxidation Behavior of U-Si-Al and U-Si-B Compositions
Elizabeth Sooby Wood, Joshua T. White, Darrin D. Byler, Andrew T. Nelson

14:40 State of Knowledge and Challenges of U-Si Compounds for Use in Light Water Reactor Accident Tolerant Fuel Designs
Joshua T. White, Elizabeth S. Wood, John T. Dunwoody, Andrew T. Nelson

15:05 An Innovative Accident Tolerant LWR Fuel Rod Design Based on Uranium-Molybdenum Metal Alloy
Robert O. Montgomery, Wendy D. Bennett, Charles H. Henager, Curt A. Lavender, Mark T. Smith, Ron P. Omberg

Wednesday, September 14
13:00 – 15:30

Track 1: Fuel Performance Reliability, Operations, and Maintenance Experience

T1-2: Fuel Performance Reliability and Operational Experience II
Location: Boise Centre East, Room 410C
Session Chairs: David Schrire (Vattenfall) and Pablo Garcia (Iberdrola)

13:00 GNF Fuel and Chanel Performance: 2016 Update
Rob Schneider, Dan Lutz, Paul Cantonwine

13:25 Optimized Design of Reactor Cores for Continuous Operation of Belgian Nuclear Power Plants
Christophe Schneidesch, Maxime Haedens, Jinzhao Zhang, Arnaud Meert

13:50 Meeting the Industry Challenge to Achieve Leak free Fuel Performance
Stephen Mazurkiewicz, Christine Bretting, Christophe Petit, George Borum, Brian Friend, Dmitri Ziabletsev, Benjamin Zoladz

14:15 Emergency Responses and Solutions to Damaged Fuel Assembly Handling Events – Lessons Learned from a 2013 Fuel Positioning Issue
Claire Collignon, Jean-Mark Barthoulot, Pierre Vasseur, Yannick Lotaut

14:40 Studying Fuel Behavior with a Micromechanical Approach
Coralie Esnoul, Rodrigue Largenton, Jean-Claude Michel, Bruno Michel, Charles Petry, Antoine Boulore

15:05 Nanoscale Mechanical Behavior of Uranium Silicide Compounds
Ursula Carvajal-Nunez, Joshua T. White, Elizabeth S. Wood, Nathan A. Mara, Andrew T. Nelson

Wednesday, September 14
13:00 – 15:30

Track 5: Fuel Modeling and Analysis

T5-5: Accident Analysis
Location: Basque Centre East, Room 410A/B
Session Chair: Ken Geelhood (PNNL) and Kevin Quick (AREVA)

13:00 DNB Evaluation of PWR Steamline Break Event Using Westinghouse and CASL Coupled Code Systems
Vefa N. Kucukboyaci, Yixing Sung, Peter A. Hilton, Natalie C. Gordon, Mark A. Sugimoto, Harish Huria

13:25 AREVA NP's Industrial CFD Single-Phase Methodology and Applications for Nuclear Fuel
M. Martin, A. Hatman, A. Chatelain, K. Goodheart

13:50 CASL COBRA-TF Improvements for PWR DNB Analysis
Yixing Sung, Liping Cao, Vefa Kucukboyaci, Natalie Gordon, Robert Salko, Emre Tatli

14:15 Preliminary Modeling of Accident Tolerant Fuel Concepts under Accident Conditions
Kyle A. Gamble, Jason D. Hales

14:40 Fuel Performance Analysis of FeCrAl Cladding during LWR Operation
R.T. Sweet, N.M. George, K.A. Terrani, B.D. Wirth

15:05 Fission Gas Swelling in U_3Si_2 at LWR Conditions
Yinbin Miao, Bei Ye, Zhi-Gang Mei, David Andersson, Kun Mo, Gerard Hofman, Abdellatif M. Yacout

Wednesday, September 14
15:50 – 18:20

Track 2: Advances in Fuel Technologies (e.g.) Enhanced Accident Tolerant Fuel)

T2-9: Emerging Accident Tolerant Fuel Designs
Location: Basque Centre East, Room 420A/B
Session Chairs: Kevin Field (ORNL) and James Tulenko (Univ. of Florida)

15:50 Neutronic Feasibility Analysis of Fully Ceramic Microencapsulated Fuel for Commercial PWRs
Li Mancang, Wang Dan, Yu Yingrui, Qin Dong, Li Wenjie

16:15 Preliminary Analysis of FCM Fuel Thermal-Mechanical Performance under Normal and Transient Conditions
Wenjie Li, Changbing Tang, Zhenhai Liu, Wei Li, Ping Chen

16:40 Neutron Characterization of UN/U-Si Accident Tolerant Fuel Prior to Irradiation
Adrian S. Losko, Sven C. Vogel, Mark A.M. Bourke, Stewart L. Voit, Anton S. Tremsin, Kenneth J. McClellan, Andrew T. Nelson

17:05 Hydrothermal Corrosion Studies on Nitride Fuels
Brian J. Jaques, Jennifer Watkins, Thomas Braine, Beata Tyburska-Puschel, Peng Xu, Edward J. Lahoda, Darryl P. Butt

17:30 Production of LEU Fully Ceramic Microencapsulated Fuel for Irradiation Testing
Kurt A. Terrani, James O. Kiggans, Jake W. McMurray, Brian C. Jolly, Rodney D. Hunt, Michael P. Trammell, Grant W. Helmreich, Lance L. Snead

17:55 Accident Tolerant, Non-Oxidizable MOX Fuel Fabrication
Saleem S. Drera, Julian F. Kelly

Wednesday, September 14
15:50 – 18:20

Track 1: Fuel Performance Reliability, Operations, and Maintenance Experience

T1-3: Fuel Performance Reliability and Operational Experience III
Location: Basque Centre East, 410C
Session Chairs: Robert St. Clair (Duke Energy) and Stephen Mazurkiewcz (AREVA)

15:50 Screening Sensitivity Analysis of a PWR Fuel Assembly FEM Structural Model
Andreas Wanninger, Marcus Seidl, Rafael Maciá-Juan

16:15 Use of Monte Carlo Simulation to Quantify CIPS Risk
Dennis Hussey, Michael Y. Young, Kenny R. Epperson

16:40 Three-Dimensional FIB/EBSD Characteraization of Irradiated $HfAl_3$-Al Composite
Zilong Hua, Donna Post Guillen, William Harris, Heng Ban

17:05 Post-Irradiation Examination to Assess Performance and Safety of Nuclear Fuel
V.V. Rondinella, F. Cappia, T.A.G. Wiss, M. Marchetti, D. Papaioannou, S. Bremier, R. Nasyrow

17:30 Gamma Emission Tomography Measurements of Fuel Assemblies at the Halden Reactor
Scott Holcombe, Peter Andersson

17:55 Acoustic Sensors Devoted to the Detection of Leaking Irradiated Fuel Rod in Spent Fuel Pool
Pierre Vasseur, Jean-Marc Barthoulot, Gérard Lévèque, Jean-Yves Ferrandis

Wednesday, September 14
15:50 – 18:20

Track 5: Fuel Modeling and Analysis

T5-6: Fundamental Modeling and Advanced Materials
Location: Basque Centre East, Room 410 A/B
Session Chairs: Veronique Garat (AREVA) and Paul Van-Uffelen (ITU)

15:50 Development of Molecular Dynamics Potential for Uranium Silicide Fuels
Jianguo Yu, Yongfeng Zhang, Jason D. Hales

16:15 Simulation of Fission Gas Diffusion in UO_2 by Vacancy Clusters
Christopher Matthews, Cetin Unal, David A. Andersson

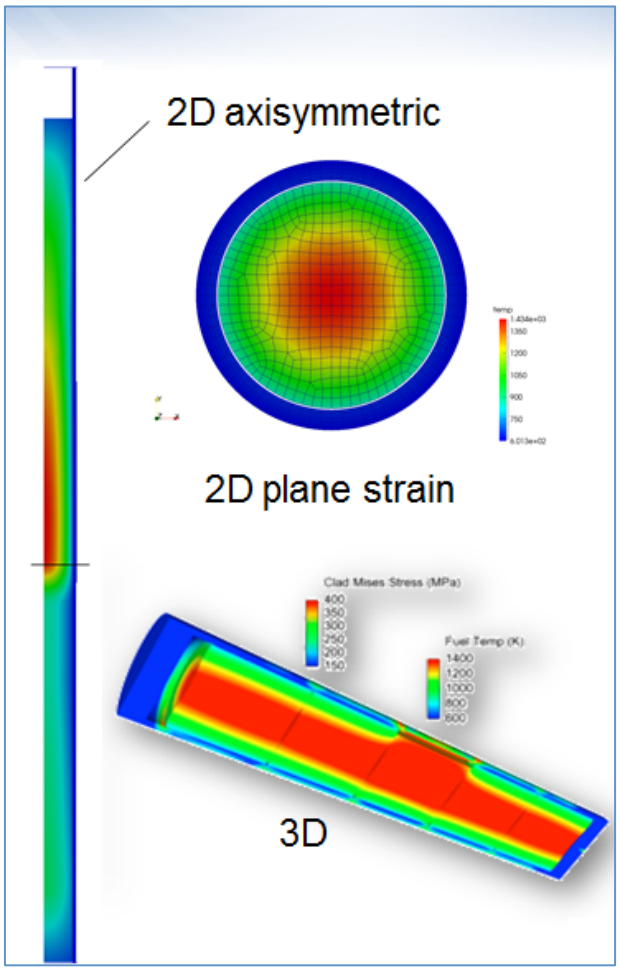
16:40 Modeling Thermochemistry of Fuel and Coupling to Fuel Performance Codes
Theodore M. Besmann, Jacob W. McMurray, Benjamin G. Gaston, Srdjan Simunovic, Markus H.A. Piro

17:05 Thermo Mechanical Analysis of Fully Ceramic Microencapsulated Fuel during In-Pile Operation
D. Schappel, K. Terrani, J. Powers, L. L. Snead, B. D. Wirth

17:30 A Preliminary Study on Irradiation Growth Behavior Modelling of N36 Zirconium Alloy Tube
Miao Yifei, Jiao Yongjun, Zhang Kun, Xing Shuo

Thursday, September 15: BISON Fuel Performance Modeling Workshop

BISON is a finite element-based nuclear fuel performance code applicable to a variety of fuel forms including light water reactor fuel rods, TRISO particle fuel, and metallic rod and plate fuel. It solves the fully coupled equations of thermo mechanics and species diffusion, for either 1D spherical, 2D axisymmetric or 3D geometries.



Fuel models are included to describe temperature and burnup dependent thermal properties, fission product swelling, densification, thermal and irradiation creep, fracture, and fission gas production and release. Plasticity, irradiation growth, and thermal and irradiation creep models are implemented for clad materials. Models are also available to simulate gap heat transfer, mechanical contact, and the evolution of the gap/plenum pressure with plenum volume, gas temperature, and fission gas addition.

An overview of MOOSE and BISON will be presented, followed by examples of running BISON. The examples begin with solving the heat equation on a simple domain and evolve to a realistic fuel performance simulation with thermo mechanics, contact, and light water reactor material models.

It will be beneficial for workshop participants to install MOOSE on a laptop in advance of the workshop, such that each participant will be able to run example problems during the session. Instructions for installing MOOSE and example problems will be emailed to preregistered workshop participants and will also be available in class. However, running MOOSE during the workshop *is not a requirement*. The workshop will be mostly lecture-style with a few examples provided.

Thursday, September 15: Idaho National Laboratory Tour

Top Fuel 2016 will feature a Technical Tour of Idaho National Laboratory facilities situated just outside of Idaho Falls, ID. This tour will be held on Thursday, September 15, with an overnight stay in Idaho Falls, and return to Boise on Friday, September 16, 2016.

Participants will tour the Experimental Breeder Reactor No. 1 (EBR-1) Atomic Museum. The facility is a National Historic Landmark where usable electricity was first generated from nuclear energy in 1951. The group will then proceed to the Transient Reactor Test Facility (TREAT), an air-cooled, thermal spectrum test facility designed to evaluate reactor fuels and structural materials. From there the group will enter the Materials and Fuels Complex (MFC), which hosts an extensive array of nuclear fuel fabrication, examination, and handling facilities, including the Hot Fuel Examination Facility (HFEF) and Fuel Conditioning Facility (FCF).

HFEF is one of the largest hot cells dedicated to radioactive materials research at Idaho National Laboratory (INL). The nation's lead laboratory for nuclear energy research and development utilizes HFEF capabilities for remote handing of highly irradiated materials to support research and development of safer and more efficient fuel designs and to evaluate material performance after irradiation.

FCF has unique capabilities that make it an ideal facility for its primary mission to support treatment of DOE-owned sodium-bonded metal fuel. In a secondary role, FCF also supports work to demonstrate the technical feasibility of pyroprocessing technology for treating used nuclear fuel for DOE's Fuel Cycle Research and Development Program. Pyroprocessing is a technology that uses electricity to separate waste products from useful materials in used nuclear fuel, including electrorefining and cathode processing.

Key Speaker Biographies

Kemal Pasamehmetoglu

Top Fuel 2016 General Chair
Director, Gateway for Accelerated Innovation in Nuclear (GAIN)
Idaho National Laboratory

Dr. Kemal Pasamehmetoglu has been with INL since 2004, most recently serving as the Associate Laboratory Director for the Nuclear Science & Technology Directorate since 2012, and was instrumental in the launch of the Gateway for Accelerated Innovation in Nuclear (GAIN) initiative. Prior to his time at INL, he held senior technical leadership positions at Los Alamos National Laboratory. Kemal also served as the national technical director (NTD) for Advanced Fuels Research and Development in the Advanced Fuel Cycle Initiative. During his tenure as a fuels and materials division director and as a NTD he has transformed nuclear fuels capabilities in the nation and at INL into world-leading endeavors. He holds a doctorate in mechanical engineering from the University of Central Florida and has 30 years of research and engineering experience within the national laboratory system.

Brad Little

Lieutenant Governor, State of Idaho

Brad Little was appointed Idaho's 37th Lieutenant Governor on January 6, 2009, elected in 2010, and reelected Lt. Governor in 2014. A native of Emmett in Gem County, Little is a third-generation Idahoan. He has dedicated his life and career to continuing both his family's ranching interests and its history of service to the people of Idaho. Little married Weiser native Teresa Soulen in May 1978. They have two sons and daughters-in-law, Adam and Angela and David and Kelsey and three grandchilden.

A graduate of the University of Idaho, Little has strived to be a good steward of the land as well as a responsible citizen. He has succeeded in both areas by encouraging sustainable agriculture and by getting involved in public policy from a young age. Little's personal philosophy has been consistent throughout his career - to ensure the lightest possible hand of government in the lives of citizens and businesses.

A successful businessman himself as the head of Little Enterprises, Inc. (a diversified farming and cattle operation), Little is a former chairman of the Idaho Association of Commerce and Industry (IACI), the Idaho Wool Growers Association, and vice chairman of the Idaho Community Foundation. He is currently a member of the board of directors of Performance Design Incorporated, a small Boise-based manufacturing company.

Little was appointed to fill a Senate vacancy in May 2001, and was subsequently elected and reelected senator from District 11 four times. In the Idaho Senate, Little rose quickly into leadership, being elected by his peers as Majority Caucus Chairman in 2003. He held this position until Governor C.L. "Butch" Otter appointed him to fill the vacancy left by then Lt. Governor Jim Risch's election to the U.S. Senate in January of 2009. He was elected Lt. Governor on November 2, 2010.

The constitutional duties of the Lieutenant Governor are to preside over the Idaho State Senate when it is in session and to fill in for the governor when he is out of the state. Additionally, the Lieutenant Governor performs such duties as the governor may deem necessary for the good of the state, including serving as the Governor's chief appointment officer, vetting candidates for boards, commissions, and councils, and facilitating economic development.

John Kotek

Principal Deputy Assistant Secretary, Office of Nuclear Energy
U.S. Department of Energy

John Kotek was appointed in January 2015 to the position of Principal Deputy Assistant Secretary for the Office of Nuclear Energy. The Office is responsible for conducting research on current and future nuclear energy systems, maintaining the government's nuclear energy research infrastructure, establishing a path forward for the nation's spent nuclear fuel and high-level nuclear waste management program, and a host of other national priorities.

Prior to his appointment as Principal Deputy Assistant Secretary, John was the Managing Partner of the Boise office of Gallatin Public Affairs, a public affairs and strategic communications consulting company. John advised energy, natural resources and other clients facing complex communication and government relations challenges.

From 2010-2012, John served as Staff Director to the Blue Ribbon Commission on America's Nuclear Future, which recommended a new strategy for managing nuclear waste in the United States.

From 2003-2006, John was Deputy Manager of the U.S. Department of Energy's (DOE's) Idaho Operations Office. In that role he was responsible for development and management of the INL contract and interface with the INL cleanup effort.

Before joining DOE in July 2003, John worked for Argonne National Laboratory as the Gen IV and Nuclear-Hydrogen Programs Manager. He directed ANL's participation in the Gen IV technology roadmapping project, an international effort focused on evaluating and developing the next-generation of nuclear energy systems.

In 2002, John was the American Nuclear Society's Glenn T. Seaborg Congressional Fellow. John served in the Office of Senator Jeff Bingaman (D-NM), Chairman of the Senate Energy and Natural Resources Committee.

John started his career with DOE's Office of Nuclear Energy, Science and Technology. John holds a Bachelor of Science in Nuclear Engineering from the University of Illinois and a Master of Business Administration from the University of Maryland. He lives in Boise, Idaho with his wife Denise and their three children.

Scot A. Greenlee

Senior Vice President, Engineering and Technical Services
Exelon Nuclear Generation

Scot Greenlee is responsible for governance and oversight of engineering functions at the twenty two Exelon nuclear plants and the Fort Calhoun Nuclear Station. He is also responsible for nuclear fuel procurement, fuel fabrication, core designs and probabilistic risk assessment for the Exelon sites.

Scot started his nuclear career in 1984 as an officer in the United States (U.S.) Nuclear Navy. He spent seven years in the Nuclear Navy, including a tour on a nuclear submarine and a tour at a Navy nuclear prototype facility. Following a successful Navy career, Scot spent four years as an inspector in the U.S. Nuclear Regulatory Commission (NRC). His NRC experience included two years as a Resident Inspector at the Beaver Valley Nuclear Station. Scot's nuclear utility experience started in 1995 as the Operations Staff Superintendent at the Salem Nuclear Generating Station. After leaving Salem in 1997, before coming to Exelon, Scot held engineering leadership positions at three nuclear utilities, including two rotations as a Site Engineering Director. Scot joined Exelon in 2007 as a Corporate Engineering Director. He was subsequently assigned as the Byron Site Engineering Director before being promoted to the position of Vice President of Engineering in May of 2011 and Senior Vice President of Engineering and Technical Services in July of 2013.

Scot obtained a Bachelor of Electrical Engineering degree from the Georgia Institute of Technology. He completed Navy Nuclear Power School and Prototype Training, NRC Inspector Training and the Institute of Nuclear Power Operations Senior Nuclear Plant Management Course.

Other Affiliations

Advisory Board member for the University of Illinois at Chicago College of Engineering.

Technical Chair for the EPRI Materials Action Plan Committee.

EPRI Nuclear Power Council Executive Committee member.

PWR Owners Group Executive Management Group and Executive Committee member.

Yongjun Jiao

Chief Engineer, Nuclear Fuel Research and Development
China National Nuclear Corporation (CNCC)

Mr. Yongjun Jiao has more than twenty years of experience as a Nuclear Engineer with Nuclear Power Institute of China (NPIC) since he graduated from Harbin Shipping Building Engineering Institute in 1993. He has focused on nuclear fuel design and research for more than sixteen years.

His current position at China National Nuclear Corporation (CNNC) is Chief Engineer of Nuclear Fuel Research and Development, primarily responsible for product developing and advanced fuels developing for Light Water Reactors with enhanced accident tolerance. Previously, he has held different positions in the nuclear reactor core and structure design and development.

Margaret McGrath

Project Manager, OECD Halden Reactor Project

Margaret comes originally from the UK, where she worked in nuclear materials research for the utility company the CEGB, at Berkeley Nuclear Labs, from 1987 to 1997. In 1995 she was seconded to the Halden Reactor Project (the CEGB – now EDF Energy - is one of the participating organizations), and took the opportunity in 1997, during the privatization of the nuclear industry in the UK, to remain as a permanent member of the Halden research staff. From 1997 – 2008 she project-managed various fuels and materials experiments, both for contract customers as well as for the HRP Joint Programme becoming Research Director for the Nuclear Safety and Reliability Sector at the end of 2008. At the beginning of 2009, she was appointed to the position of Deputy Project Manager of the HRP, becoming Project Manager at the beginning of 2015. Her specialist area is LWR fuel cladding behaviour, although her PhD is in stainless steel behaviour, and she has a Bachelor Degree (B. Eng Hons) in Metallurgy.

Jon Carmack

National Technical Director
U.S. Department of Energy Fuel Cycle Research and Development Advanced Fuels Program

Dr. Jon Carmack began his career at the Idaho National Laboratory in 1991 in the Fuels and Materials Department after graduating with a BS and MS in Nuclear Engineering from the University of Washington. He left the INL in 1999 and spent 5 years at Babcock and Wilcox in Lynchburg, Virginia before returning to the INL in 2004 to join the DOE FCRD program. He obtained his PhD from the Department of Nuclear Engineering, University of Idaho, focusing on fuel cladding interaction formation in fast reactor metallic fuels in 2012. The FCRD Advanced Fuels Campaign is responsible for the DOE LWR Accident Tolerant Fuel Program as well as the development of advanced fuels for transmutation in advanced reactor systems.

John Strumpell

Manager, Nuclear Fuel Research & Development
AREVA, Inc.

Mr. Strumpell holds a B.S. in Mechanical Engineering from Louisiana Tech University (1983) and an M.S. in Mechanical Engineering from Southern Methodist University (1989). His experience includes developing a nuclear fuel for a world-market and managing engineering teams in the structural and fuel performance disciplines.

Currently, Mr. Strumpell is the Manager of the Fuel R&D activities in the U.S. In this role he is part of the AREVA Global Fuel Organization responsible for developing the fuel product strategy and R&D portfolio for product and code development.

He is also active in several industry interfaces for U.S. Fuel activities, such as the DOE program on Accident Tolerant Fuel, EPRI Fuel Reliability Programs, Consortium for Advanced Simulation of Light Water Reactors (CASL) and University collaborations.

Aylin Kucuk

Manager, HYDRanZeA Project
EPRI Nuclear Fuel Industry Research Program

Dr. Aylin Kucuk joined EPRI in December 2005 as a member of the Fuel Reliability Program (FRP) and has managed several collaborative industry research projects related to Zircaloy fuel cladding performance in both BWRs and PWRs. Dr. Kucuk is currently managing the HYDRanZeA project for EPRI's Nuclear Fuel Industry Research (NFIR) Program which is investigating the role of nickel in hydrogen pickup by Zircaloy-2. She is also managing research activities related to BWR fuel cladding corrosion and crud and other assembly component issues. Prior to joining EPRI, Dr. Kucuk worked at the Mechanical and Nuclear Engineering Department at the Pennsylvania State University as a post-doctoral researcher. She received her PhD from the Penn State University in 2004 under Professor Arthur T. Motta. Her thesis title was "Microstructural Basis of Uniform Corrosion in Zr Alloys."

Michelle Bales

Senior Reactor Engineer, Office of Nuclear Regulatory Research
U.S. Nuclear Regulatory Commission

Mrs. Bales is a senior reactor engineer in the U.S. Nuclear Regulatory Commission's (NRC) Office of Nuclear Regulatory Research focused on nuclear fuel and cladding research. She holds a master's degree in Nuclear Engineering from the Pennsylvania State University and a bachelor's degree in Mechanical Engineering from the University of Maryland.

Mrs. Bales serves at the NRC's representative to multiple international collaborative research and development programs focused on nuclear fuel performance under accident conditions. She serves on an NRC working group responsible for revising the NRC's Loss-of-Coolant Accident regulatory criteria (10 CFR 50.46) to account for emerging research results and other commission directed policy matters. She is also responsible for NRC's research on the performance of nuclear fuel in spent fuel storage and transportation conditions.

Mark Freisthler

Engineer, Transport Airplane Directorate
Airframe and Interior Standards Staff

Mark Freisthler is currently an engineer with the Transport Airplane Directorate (TAD), on the Airframe and Interior standards staff. Mark's assignments include the development of FAA policy and guidance materials for means of showing compliance to current FAA regulations concerning the introduction of new materials on certified commercial airplane. Part of Mark's assignments is being the TAD representative on several government/industry consortiums dealing with material mechanical properties. These consortiums include the Metallic Materials Properties Development and Standardization (MMPDS), the Composite Materials Handbook 17 (CMH-14), and the SAE international committing developing industry specification for Additive Manufacturing (AM) materials.

Prior to joining the FAA, Mark spent 21 years as an engineer with the Boeing. Mark's main assignment was the development of material design values. Mark participated in both commercial and military projects including the 757 and 767, B-2 bomber and Advance Tactical Fighter (prototype for the F-22), 777.

Erik V. Mader

Technical Executive in the Fuel Reliability Program, Nuclear Sector
Electric Power Research Institute

Dr. Erik Mader joined EPRI in March, 2006 as a member of the Fuel Reliability Program (FRP) and has managed the efforts for fuel performance and reliability assessments for both PWR and BWR fuel and assembly components.

Currently Erik is managing the Hydrogen Impacts and Channel Distortion research focus areas and is also the Executive Director for the CASL Industry Council. For the previous 10 years before 2006, Erik worked in the Naval Reactors (NR) program at the Bettis Laboratory in Pittsburgh, PA and at the Naval Reactors Facility (NRF) at the Idaho National Laboratory. At Bettis, Erik worked on modeling clad corrosion and fuel element performance.

While at NRF, Erik was the technical lead for the two largest expended-core (spent fuel) campaigns in the NR program that examined cores from the USS Nimitz and USS Eisenhower aircraft carriers. Erik received his doctorate from UC Santa Barbara in 1995 under Professor Bob Odette and his thesis was titled, "Kinetics of Irradiation Embrittlement and the Post Irradiation Annealing of Nuclear Reactor Pressure Vessel Steels."

Ron Adamson

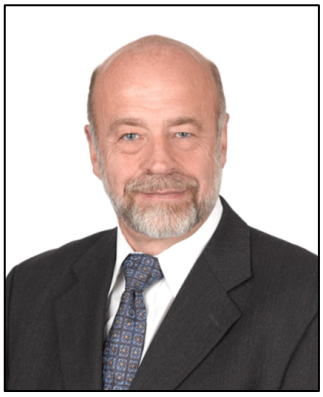
Consultant in Zirconium Technology
Former Manager of Materials Technology, GE Nuclear Energy

Dr. Ron Adamson retired from GE Nuclear Energy in 2000, where he was the manager of Materials Technology. Earlier he graduated from the University of Wisconsin with a B.S. in Mechanical Engineering, an M.S. in Nuclear Engineering and a PhD in Metallurgy. Post-doctoral work on irradiation effects was conducted at AERE, Harwell, England. At the GE Vallecitos Nuclear Center he led research, development and testing programs for reactor core materials, with special emphasis on zirconium alloys. During his 31 years with GE, Dr. Adamson was actively involved with utilities and the technical community worldwide. He holds 17 patents, has published over 100 technical papers involving nuclear materials technology, and has received several important awards, including the Outstanding Technical Contribution Award from GE Industrial Power Systems, the Mishima Award from the American Nuclear Society, and the Kroll Medal from the ASTM/Kroll Institute. Since retirement he has been actively associated with ANT International, EPRI and others as a consultant (ZIRCOLOGY PLUS) in zirconium technology

Zirconium alloy areas in which Dr. Adamson has particular interest and experience include: in-reactor dimensional stability; in-reactor corrosion performance and mechanisms; microstructure evolution due to reactor irradiation; mechanical properties of irradiated material; high burnup performance; failure mechanisms and remedies; and fabrication technology.

Albert Machiels

Senior Technical Executive
Electric Power Research Institute



Dr. Albert Machiels is a Senior Technical Executive at the Electric Power Research Institute [EPRI]. In this role, he is responsible for providing technical expertise on topics related to used fuel management, fuel cycles, and advanced generation technologies. Dr. Machiels has close to 50 years of involvement in various fields of nuclear technology R&D, including faculty and program direction positions at several universities and at EPRI. In 2012, Dr. Machiels received an EPRI Lifetime Achievement Award for his numerous technical contributions.

David Schrire

Senior Specialist in Fuel Performance
Vattenfall Nuclear Fuel

David Schrire has a B Sc. degree in Nuclear Engineering from Queen Mary College, University of London and a Masters in Nuclear Engineering from Purdue University. He has worked in the area of fuel performance since 1983, earlier at Studsvik Nuclear and ABB Atom (now Westinghouse Sweden) and since 2004 at Vattenfall Nuclear Fuel where he is a Senior Specialist in Fuel Performance. While at ABB Atom he led a program to evaluate the consequences of cladding hydriding, and later at Studsvik he initiated the Studsvik Cladding Integrity Project (SCIP), an international project to study hydrogen-assisted cladding failure mechanisms under normal operation or anticipated operating occurrences.

Ioan Arimescu

Senior Expert
AREVA

Dr. Arimescu is a Senior AREVA Expert, with more than 30 years of experience in nuclear fuel R&D and engineering, encompassing the full spectrum of associated activities: global fuel behavior modeling and performance analysis (PCI), modeling fuel and cladding materials behavior under irradiation, conducting and interpreting PIE examinations, separate-effects tests both out-of-pile and in-pile, design review and manufacturing QC/QA. Some of main contributions are: mechanistic FGR model, RXA Zr alloy irradiation growth model, BWR cladding H uptake model, best-estimate statistical methodology for fuel thermal-mechanical design analysis.

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Boise Centre Maps
&
Program At-A-Glance

PARKING INFORMATION

boise | centre

Parking for the Boise Centre is available at primary parking facilities through an agreement with the Downtown Public Parking System

PARKING RATES

FIRST HOUR FREE

Hourly	$ 2.50
All Day	$12.00

For special event group parking arrangements please contact the DPPS

Call Maggie Decker, phone 208-368-7944 or email at mdecker@carparkusa.com for an event request form and more parking information.

DESIGNATED EVENT PARKING

CITY CENTRE GARAGE

Corner of 9th and Front Streets
Entrance on Ninth Street
208-424-7855

HOURS

6:30 AM - 11:00 PM DAILY

ADDITIONAL PARKING AVAILABLE AT THESE GARAGES

CAPITOL TERRACE GARAGE

Main and Idaho Streets
Entrances on Main and Idaho
208-336-1068

HOURS

Open 24 hours / 7 days a week

EASTMAN GARAGE

Main and Idaho Streets
Entrances on Main and Idaho
208-336-2662

HOURS

Monday - Friday	6:30 AM - 9:00 PM
Saturday	8:30 AM - 9:00 PM
Sunday	Closed

Courtesy Shuttle Information Sheet

Boise Express is the shuttle service provider for The Grove Hotel.

Arrival:

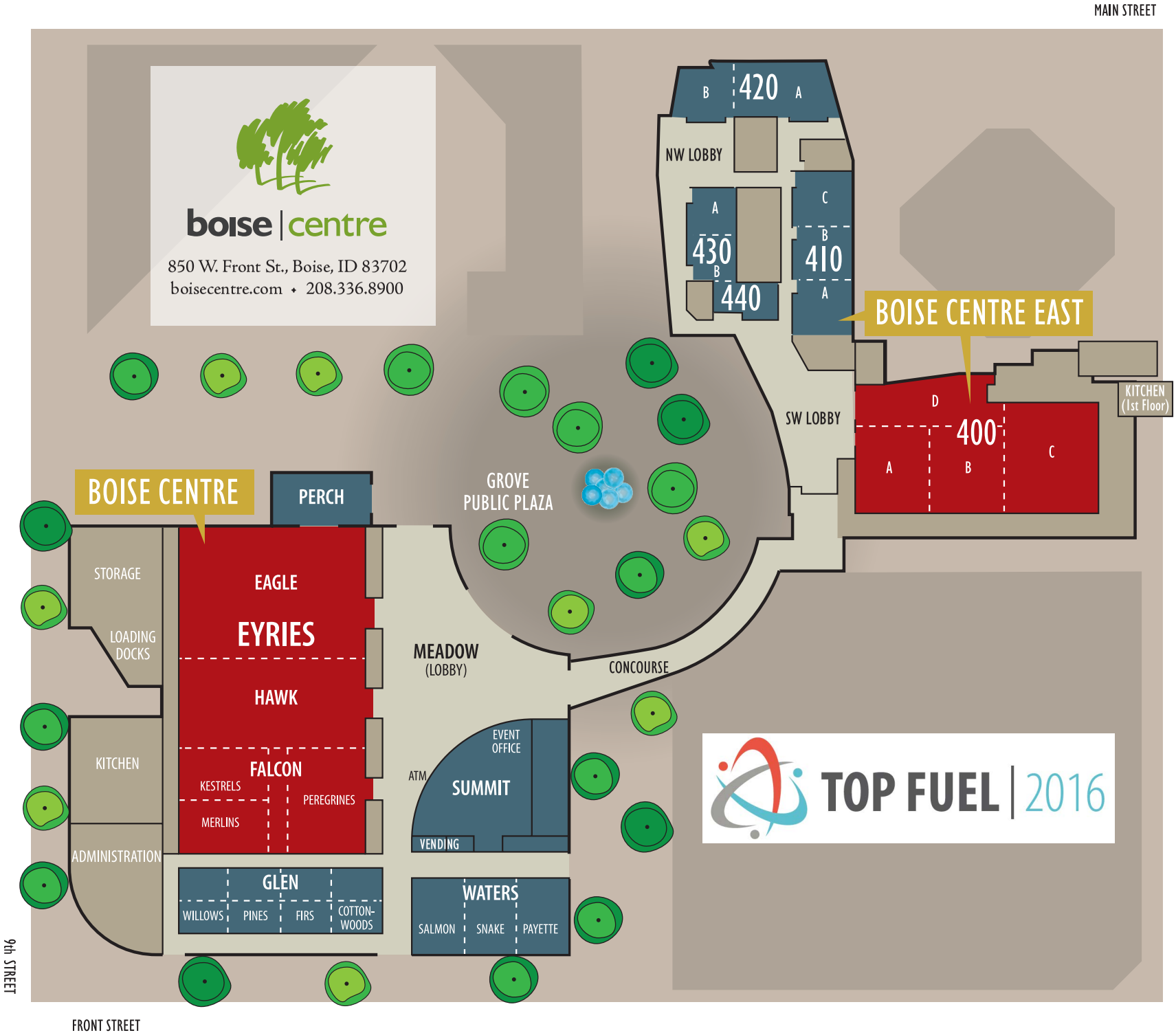
Please exit baggage claim proceed to the courtesy transportation pick-up area. Shuttles arrive on a rotation of every 15 minutes for all arriving flights. If you have any concerns you may contact the hotel directly 208-333-8000. The shuttles are white and display the Grove Hotel logo.

Departure:

Shuttles leave the hotel at the 15 and 45 minute mark of each hour beginning at 4:15am and ending at 10:15am. These shuttles are automatic each day no reservation is required. After 10:15am the shuttle service is reservation only, these shuttles will continue at the 15 and 45 minute mark of each hour for the remainder of the day. For transportation after 10:15am you may reserve your shuttle with Guest Services.

For any parties larger than 14 guests please contact your sales manager for special group arrival and departure services.

BOISE CENTRE FACILITY MAP



September 11 (Sunday)		September 12 (Monday)				September 13 (Tuesday)				
		7:00	Registration Opens			7:00	Registration Opens			
		7:00-8:00	Continental Breakfast			7:00-8:00	Continental Breakfast			
		8:00-9:30	**Opening Plenary** Summit Auditorium Boise Centre			8:00-9:30	**Special Session:** **ATF - Bringing Advanced Technologies Into Risk Adverse Industry** Summit Auditorium Boise Centre			
		9:30-10:00	Coffee Break			9:30-10:00	Coffee Break			
		10:00-11:30	**Plenary II** Summit Auditorium Boise Centre			10:00-11:40	**T2-3** 420 A/B	**T3-3** 410 C	**T5-1** 410 A/B	
		11:30-12:50	Lunch On Your Own			11:40-13:00	Lunch On Your Own			
12:50-17:00	Conference Registration and Exhibit Set-Up Boise Centre East, 4th Floor	12:50-15:20	**T2-1** 410 A/B	**T4-1** 430 A/B	**T3-1** 410 C	13:00-15:30	**T2-4** 420 A/B	**T3-4** 410 C	**T5-2** 410 A/B	
		15:20-15:40	Coffee Break			15:30-15:50	Coffee Break			
		15:40-18:00	**T2-2** 410 A/B	**T4-2** 430 A/B	**T3-2** 410 C	15:50-18:20	**T2-5** 420 B	**T3-5** 410 C	**T5-3** 410 A/B	**T2-6** 420 A
18:00-19:30	**Opening Reception** (Appetizers and Drinks) 420 A/B	18:30-20:00	**Poster Session** (Light Appetizers and Drinks) 420 A/B			18:30-21:30	**Conference Banquet** Social Hour and Banquet Dinner (Basque Center)			

September 14 (Wednesday)				September 15 (Thursday)				September 16 (Friday)		
7:00	**Registration Opens**									
7:00-8:00	**Continental Breakfast**									
8:00-9:30	**Special Session:** **Hydrogen Impacts in Zirconium Alloy Materials** Summit Auditorium, Boise Centre			8:00-9:30	**BISON Workshop** 420 B	**OECD / NEA EGATFL Meeting*** 420A	INL Technical Tour (Boise to Idaho Falls) 7:00 - 18:00	8:00-9:30	**OECD / NEA EGATFL Meeting*** 420A	INL Technical Tour (Idaho Falls to Boise) 8:00 - 13:00
9:30-10:00	Coffee Break			9:30-10:00	Coffee Break			9:30-10:00	Coffee Break	
10:00-11:40	**T2-7** 420 A/B	**T1-1** 410 C	**T5-4** 410 A/B	10:00-11:40	**BISON Workshop** 420 B	**OECD / NEA EGATFL Meeting*** 420A		10:00-11:40	**OECD / NEA EGATFL Meeting*** 420A	
11:40-13:00	Lunch On Your Own			11:40-13:00	Lunch On Your Own			11:40-13:00	Lunch On Your Own	
13:00-15:30	**T2-8** 420 A/B	**T1-2** 410 C	**T5-5** 410 A/B	13:00-14:30	**BISON Workshop** 420 B	**OECD / NEA EGATFL Meeting*** 420A		13:00-14:30	**OECD / NEA EGATFL Meeting*** 420A	
15:30-15:50	Coffee Break			14:30-15:00	Coffee Break			14:30-15:00	Coffee Break	
15:50-18:20	**T2-9** 420 A/B	**T1-3** 410 C	**T5-6** 410 A/B	15:00-17:00	**BISON Workshop** 420 B (adjourns at 16:00)	**OECD / NEA EGATFL Meeting*** (adjourns at 17:00)		15:00-17:00	**OECD / NEA EGATFL Meeting*** 420A	

T-1 Track 1. Fuel Performance Reliability and Operational Experience
T-2 Track 2. Advances in Fuel Technology
T-3 Track 3. Off-Normal Fuel Behavior
T-4 Track 4. Used Fuel Storage, Transportation, and Reuse/Recovery
T-5 Track 5. Fuel Modeling and Analyses

*The OECD/NEA EGATFL meeting will have limited space available. Although observers can attend, space in the meeting must first accommodate EGATFL committee members.